Inventor: BOWE ET AL
Serial No.: 10/536,726
Filing Date: 05/27/2005
Examiner: J.F. Parsa
Group Art Unit: 1621

REMARKS

The Office action of August 8, 2006 has been carefully considered and the application has been amended accordingly.

Claims 1-14 are present in the application. Applicants confirm the election of claims 1-9, with traverse. Claims 10-14 depend from parent claim 1 and, therefore, upon allowance of claim 1, claims 10-14 are deemed to be allowable therewith.

The Abstract is presented on a separate sheet. The Abstract was previously presented with the PCT application. It seems to be superfluous to require that the Abstract be presented, again, and on a separate page. Can this requirement be rectified?

Claims 1-9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Schanke et al. (US 6,211,255) in view of Schweitzer *et al.* (US 2003/0018089 A1). In effect, the Examiner is suggesting that the present invention might be obvious in the light of Schanke et al (US 6 211 255) combined with Schweitzer et al (US 2003/0018089). However, Applicants respectfully submit that most of the Examiner's arguments appear to be based solely on Schanke *et al.* A fundamental distinction between the present invention and that of Schanke *et al.* is the requirement of parent Claims 1 and 9 that the Applicants' Fischer-Tropsch process must be carried out in **at least two successive stages**, and the **gases being cooled between the successive stages** so as to condense water vapour. These features are not taught, nor even suggested by Schanke *et al.*, who only suggest passing the gases once through the reactor (coming in through the gas inlet 14 and emerging through the gas outlet 16). It will also be noted that Schanke *et al.* is aiming to achieve very high conversions (> 90%)

Inventor: ROWE ET AL.
Serial No.: 10/536,726
Filing Date: 05/27/2005
Examiner: J.F. Parsa
Group Art Unit: 1621

on a single pass (see column 4 lines 43-45), indicating that their design of reactor enables such high conversions to be achieved using a reactor height of about 20 m (see FIG. 9). They emphasize that this is a much higher conversion than can be achieved with the other reactor designs: a slurry bubble column reactor or a multi-tubular fixed-bed reactor.

It is thus clear that Schanke *et al.* are not suggesting a two-stage Fischer-Tropsch process as defined by Applicants' claims.

The Examiner has also suggested that the space velocity disclosed in Example 3 overlaps with the space velocity required in the present invention. However the space velocity required in the present invention (as specified for example in claims 5 and 6) is between with 1000 and 15000/hr, this parameter being defined as the "the volume flow rate of the gases supplied to the reactor (measured at STP), divided by the void volume of the reactor." (Specification, page 2 lines 17-20). This is a different parameter to the "space velocity" as defined by Schanke *et al.* wherein the space velocity is the volume flow rate of the gases supplied to the reactor (measured at STP), but divided by the mass of catalyst present in the reactor (see column 8 lines 64-65, and column 10 lines 15-17 and the footnote *) to the table in column 10). It will be appreciated that these parameters are different, so they cannot be directly compared. But in any event Schanke *et al.* does not teach or suggest the selection of a particular space velocity in order to obtain a particular conversion; rather the space velocity is different for every different type of catalyst that was tested.

A further distinction from Schanke et al, is that in the

present invention the catalyst is on the insert structure, i.e. the corrugated foils, but not on the channel walls, whereas in the Schanke *et al.* arrangement the entire monolith (which as indicated in Fig. 9 may be many meters long, and as shown in Figs. 1 and 3 may be of a similar diameter to its length) is entirely covered in catalyst coating.

The Examiner has then cited Schweitzer *et al.* in relation to claim 9. This patent relates to a slurry reactor, and is concerned with a system (11, 14, 17, 12, 16) for recirculating slurry outside the reactor vessel, including means to purge that recirculating circuit. This purge uses pressurized liquid and gas obtained by condensing vapors produced by the Fischer-Tropsch system (4, 31), and compressing them (35) to a pressure above that of the slurry recirculation duct. In paragraph 69 they emphasize that it is important not to use water or water vapor to purge the circuit, as it would deactivate a cobalt catalyst. But this is in the context of selecting a fluid for purging the recirculation circuit of a slurry reactor. They are not concerned with a two-stage Fischer-Tropsch reactor: indeed the tail gases from the Fischer-Tropsch reaction are evacuated via the line 32. There is no teaching or suggestion that the gases should be subjected to a second stage of Fischer-Tropsch synthesis as set forth in Applicants' claims.

It may well be known that water is detrimental to a cobalt catalyst, but the concept of performing Fischer-Tropsch synthesis using a compact catalytic reactor in two successive stages, condensing water vapor between the stages, and at such a flow velocity that water vapor does not exceed 20 mole%, is certainly not suggested by the prior art. Indeed none of the citations suggest a two stage Fischer-Tropsch synthesis using compact

Inventor: BOWE ET AL
Serial No.: 10/536,726
Filing Date: 05/27/2005
Examiner: J.F. Parsa
Group Art Unit: 1621

catalytic reactors.

In view of the foregoing, reconsideration of the application is requested and allowance of elected claims 1-9, and dependent claims 10-14, is courteously solicited.

Finally, the Examiner has raised an issue of double patenting based on US 7 067 561 (Bowe). This rejection is believed to be in error and not in conformity with US law. The cited patent is a later invention, with a later filing date, and a later expiration date; thus, a terminal disclaimer is therefore not appropriate. In any event the later invention set out in the patent is clearly patently distinct from the present invention in requiring that each stage is carried out using a plurality of reactor modules operating in parallel, and having the same number of reactor modules for each of the successive stages, etc. The Examiner's position is that "It would therefore have been obvious to one of ordinary skill in the art **at the time the invention was made** to optimize the reaction condition . . ."; but the Examiner has not identified which "invention" is being referred to. As far as the present invention is concerned, this argument clearly does not stand up, because "at the time the (present) invention was made" this citation had not yet been invented.

Respectfully submitted,

November 8, 2006
Date

William H. Holt
Reg. No. 20766
Customer No. 25628

Inventor: BOWE ET AL
Serial No.: 10/536,726
Filing Date: 05/27/2005
Examiner: J.F. Parsa
Group Art Unit: 1621

Law Offices of William H. Holt
12311 Harbor Drive
Woodbridge, Virginia 22192

Telephone: 703-491-8880
Facsimile: 703-491-8444

Email: WilliamHolt@HoltLawOffices.com

I hereby certify that this correspondence is being transmitted by facsimile this day to Examiner Parsa at the United States Patent and Trademark Office, Art Unit 1621, to fax No. 571-273-8300.

11-8-2006 W.H. Holt

Date Signature